REMARKS

In response to the Office Action mailed October 14, 2001, Applicants have cancelled claims 14, 15 and 19-22, added claims 23-28, and amended claims 1-13 and 16-18. Applicants reserve the right to file one or more divisional applications directed to the subject matter covered by claims 19-22.

Claims 1-13, 16-18 and 23-28 are presented for examination.

Claims 1 and 12 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,114,908 ("Sato '908").

Claims 1 and 12 are the only pending independent claims. As amended, these claims cover a superconducting article in the form of a cable. The article includes a ceramic superconductor and a sealing structure that encircles the outer surface of the ceramic superconductor. The sealing structure includes a cured polymer layer.

Sato '908 discloses a superconductor article, but, as near as Applicants can tell, Sato's superconductor article does not have a sealing structure formed that ***encircles*** a ceramic superconductor, as required by claims 1 and 12. Accordingly, Applicants request reconsideration and withdrawal of the rejection of claims 1 and 12 under 35 U.S.C. §102(b) as being anticipated by Sato '908.

Claims 1, 2 and 6-15 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,276,281 ("Sato '281") or under 35 U.S.C. §103(a) as being unpatentable over Sato '281.[1]

Sato '281 discloses a superconductor article having oxide superconductors 6 mounted on a pipe 5 and bound with Teflon tape 8. (Sato '281 col. 4, lines 40-55 and Fig. 2). The Examiner likened Sato's Teflon tape to the sealing structure required by claims 1, 2 and 6-15. (Office Action at 4). Applicants do not concede that this analogy is appropriate, however, assuming *arguendo*, that the analogy is appropriate, Sato's Teflon tape does not ***encircle*** a ceramic superconductor, as required by claims 1, 2 and 6-13. Nor is there any suggestion in Sato to

[1] Claims 14 and 15 have been cancelled, and so the rejection of these claims should be withdrawn.

modify his Teflon tape to encircle a ceramic superconductor. Applicants therefore request reconsideration and withdrawal of the rejection of claims 1,2 and 6-15 under 35 U.S.C. §§102(b)/103(a) in view of Sato '908.

Claims 1, 3-5, 7, 8 and 10-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,647,888 (Woolf). However, Woolf does not disclose or suggest a superconductor article in the form of a cable and having the sealing structure, as required by claims 1, 3-5, 7, 8, 10-13 and 16-18.[2]

Woolf discloses a superconductor article that is in the shape of a coil. (Woolf col. 2, lines 3-7 and lines 36-38 and Fig. 1). The coil includes superconducting filaments 18 embedded in a conductive metal 20, and metal 20 is potted in a matrix 11 as a ***coil***. (Id. col. 2, lines 36-44 and lines 61-63 and Figs. 1-3). According to the Examiner, Woolf's matrix is analogous to the sealing structure required by claims 1, 3-5, 7, 8, 10-13 and 16-18. (Office Action at 6). Applicants do not concede that this analogy is proper, but assuming *arguendo*, that the analogy were proper, Woolf's matrix is formed of a dielectric containing a heat absorbing material, rather than a cured polymer. (Woolf col. 2, lines 44-46). Moreover, Woolf does not disclose that his article can be a ***cable***. Thus, modification of Woolf's article to provide the article covered by claims 1, 3-5, 7, 8, 10-13 and 16-18 would involve both replacing Woolf's dielectric/heat absorbing combination matrix with a cured polymer and then forming the article as a cable. But, as known to those skilled in the art, Woolf's dielectric/heat absorbing combination matrix material is relatively brittle and could not withstand the bend diameters typically encountered in a superconductor cable. Thus, after reading Woolf, one skilled in the art would not have been motivated to modify Woolf's superconductor article to provide the article covered by claims 1, 3-5, 7, 8, 10-13 and 16-18. Applicants thus request reconsideration and withdrawal of the rejection of claims 1, 3-5, 7, 8 and 10-18 under 35 U.S.C. §103(a) in view of Woolf.

Claims 2, 5 and 10-18 were rejected under 35 U.S.C. §112, second paragraph. Applicants amended these claims to obviate the rejection. Applicants therefore request reconsideration and withdrawal of this rejection.

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[2] Claims 14 and 15 have been cancelled, and so the rejection of these claims should be withdrawn.

The Examiner objected to the specification and indicated that the chemical composition for the registered trademark "Desolite" must be specified. The specification discloses (Application at page 26, line 29-page 27, line 4):

> Suitable curable polymers include the Desolite® 2002-17 family from Desotech (Elgin, IL) which are UV curable acrylate polymers. This family of polymers has superior mechanical properties at cryogenic temperatures. For example, at 77 K, the ultimate tensile strength (UTS) is at least about 100-160 Mpa and the elongation is at least about 0.3% to 0.5%.

Thus, with respect to the Desolite® polymers, Applicants disclosed the particular tradename, manufacturer, location of manufacturer, type, ultimate tensile strength properties, and elongation properties. Applicants thus believe they have met the requisite standard of clarity regarding the use of products having a registered trademark. See M.P.E.P. §608.01(v). Accordingly, reconsideration and withdrawal of this objection is requested.

The Examiner objected to the drawings. Applicants intend to submit formal drawings to obviate this objection.

Attached is a marked-up version of the changes being made by the current amendment.

Applicants believe the application is in condition for allowance, which action is respectfully requested. Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Version with markings to show changes made

In the claims

Claims 14, 15 and 19-22 were cancelled.

The claims were amended as follows.

1. (Once Amended) A superconducting [ceramic conductor for use in a preselected fluid cryogen] article, comprising:

a [composite] ceramic [superconducting wire] superconductor having a length and an outer surface along its length; and

a sealing structure [hermetically surrounding the outer surface] configured to form a seal to prevent [the cryogen] a cryogenic fluid at a pressure of about one atmosphere from infiltrating into the [wire and degrading its properties] ceramic superconductor through the outer surface of the ceramic superconductor,

wherein the sealing structure comprises a cured polymer layer encircling the [outside] outer surface of the [wire] ceramic superconductor, and the superconducting article is in the form of a cable.

2. (Once Amended) The [conductor] article of claim 1 further comprising a metallic [tape] layer laminated to the [composite tape] ceramic superconductor, the cured polymer layer [encircling] surrounding the [composite tape and the] metallic [tape] layer.

3. (Once Amended) The [conductor] article of claim 1, wherein the cured polymer layer comprises a metallic electrically conductive [media] medium.

4. (Once Amended) The [conductor] article of claim 3, wherein the metallic electrically conductive [media are] medium comprises metallic elements dispersed within the polymer layer.

5. (Once Amended) The [conductor] article of claim 3, wherein the [wire is] ceramic superconductor is in the form of a [composite superconducting] tape having a thickness and wherein the [conductive media permit] electrically conductive medium permits the cured polymer layer to be conductive at least along a direction parallel to the thickness of the [composite] tape.

6. (Once Amended) The [conductor] article of claim 1, wherein the [wire is] ceramic superconductor is in the form a [composite ceramic] superconducting tape [having a top face, a bottom face, and side faces, and wherein the outer surface is the top, bottom, and side faces].

7. (Once Amended) The [conductor] article claim 1, wherein the [wire and surrounding sealing structure are] article is greater than 50 meters long.

8. (Once Amended) The [conductor] article of claim 1, wherein the [wire] ceramic superconductor comprises a plurality of superconducting ceramic filaments, and the article further comprises a metallic matrix supporting [a] the plurality of superconducting ceramic filaments.

9. (Once Amended) The [conductor] article of claim 1, wherein the [wire] ceramic superconductor comprises at least one superconducting ceramic layer, and the article further comprises at least one metallic substrate supporting the at least one superconducting ceramic layer.

10. (Once Amended) The [conductor] article of claim 1, wherein the sealing structure [prevents the cryogen] is configured to prevent a cryogenic fluid at a pressure of at least about two bar from infiltrating into the [wire] ceramic superconductor through the outer surface [under pressurized conditions] of the ceramic superconductor.

11. (Once Amended) The [conductor] article of claim 10, wherein [the pressurized conditions exceed about 10 atm and the fluid cryogen is liquid nitrogen] the sealing structure is configured to prevent a cryogenic fluid at a pressure of at least about 10 atmospheres from infiltrating into the ceramic superconductor through the outer surface of the ceramic superconductor.

12. (Once Amended) A superconducting [conductor for use in a preselected fluid cryogen] article, comprising:

a [composite] ceramic [superconducting wire] superconductor having a length and an outer surface [surrounding the wire] along its length; and

a sealing structure [hermetically surrounding the outer surface permitting the superconducting ceramic conductor] configured to permit the article to withstand thermal cycling [in which the] when exposed to a fluid cryogen [is under pressurized conditions] at a pressure of at least about one atmosphere without degrading the current carrying capability of the [superconducting] ceramic [tape] superconductor by more than 10%,

wherein the sealing structure comprises a cured polymer layer encircling the [outside] outer surface of the [wire] ceramic superconductor, and the superconducting article is in the form of a cable.

13. (Once Amended) The [conductor] article of claim 12, wherein the [pressurized conditions exceed about 2 bar and the fluid cryogen is liquid nitrogen] sealing structure is configured to permit the article to withstand thermal cycling when exposed to a fluid cryogen at a pressure of at least about two bar without degrading the current carrying capability of the ceramic superconductor by more than 10%.

16. (Once Amended) The [conductor] article of claim 1, wherein the cured polymer layer has an ultimate tensile strength of at least about 100-160 MPa at 77 K.

17. (Once Amended) The [conductor] article of claim 1, wherein the cured polymer layer has an elongation of at least about 0.3% to 0.5% at 77 K.

18. (Once Amended) The [conductor] article of claim 1, wherein the cured polymer layer has an ultimate tensile strength of at least about 100-160 MPa at 77 K and an elongation of at least about 0.3% to 0.5% at 77 K.

The following claims were added.

23. (New) The article of claim 1, wherein the article further comprises a metallic layer between the cured polymer layer and the ceramic superconductor.

24. (New) The article of claim 12, wherein the sealing structure is configured to prevent a cryogenic fluid at a pressure of at least about two bar from infiltrating into the ceramic superconductor through the outer surface of the ceramic superconductor.

25. (New) The article of claim 12, wherein the sealing structure is configured to prevent a cryogenic fluid at a pressure of at least about 10 atmospheres from infiltrating into the ceramic superconductor through the outer surface of the ceramic superconductor.

26. (New) The article of claim 12, wherein the cured polymer layer comprises an electrically conductive medium.

27. (New) The article of claim 26, wherein the electrically conductive medium comprises metallic elements dispersed within the polymer layer.

28. (New) The article of claim 12, wherein the article further comprises a metallic layer between the cured polymer layer and the ceramic superconductor.